

WHAT IS CLAIMED IS:

1. A laser device, comprising a laser beam emitter having an optical resonator, wherein said optical resonator has a resonator and a reflection mirror, and at least one of a length of said resonator or a curvature of said reflection mirror is determined so as to satisfy condition that a parameter  $M^2$  of beam quality of a projected laser beam is within a range of  $8 \leq M^2 \leq 22$ , where  $M^2 = \pi W \cdot \Theta / \lambda$  ( $W$  is a beam waist of a laser beam;  $\Theta$  is a spreading angle; and  $\lambda$  is a wavelength of the laser beam).

2. An ophthalmological surgical system, comprising a laser device according to claim 1, wherein said laser device emits a laser beam in such manner that a parameter  $M^2$  of beam quality is within a range of  $8 \leq M^2 \leq 22$ .

3. A laser device according to claim 1, wherein the laser beam emitted from said laser beam emitter is propagated in an optical fiber, wherein a core diameter of said optical fiber is from 50  $\mu\text{m}$  to 75  $\mu\text{m}$ , and numerical aperture NA<sub>f</sub> of said optical fiber is 0.10~0.12.

4. A laser device according to claim 1, wherein the laser beam emitted from said laser beam emitter is propagated in an optical fiber, wherein exit numerical aperture NA<sub>e</sub> of the laser beam emitted from said optical fiber is  $0.06 \leq NA_e \leq 0.1$ .